Small Business Innovation Research/Small Business Tech Transfer

Engineered Multifunction Surfaces for Fluid Handling, Phase I

Completed Technology Project (2004 - 2005)

Project Introduction

The goal of this proposal is to investigate the applicability of recent advances in plasma manufacturing and material treatment to NASA advanced life support systems. In particular we wish to examine surface treatment, material deposition, and the use of low pressure and atmospheric pressure plasma reactors as methods of creating single-piece multi-function fluid handling surfaces. Phase I will determine the feasibility of modifying existing plasma processes to develop a number of different functionalities directly onto an aluminum or ceramic surface. Plasma deposition techniques will be used to create a hydrophilic and bactericidal surface. Etching and deposition will be used to create temperature sensors directly on a surface. Further investigation of deposition techniques will examine the feasibility of depositing thermoelectric (Pelltier) materials onto surfaces. Finally, a resource utilization analysis will be performed to determine the relative merits of creating an atmospheric pressure plasma reactor directly on a thin surface for the purpose of water purification.

Primary U.S. Work Locations and Key Partners

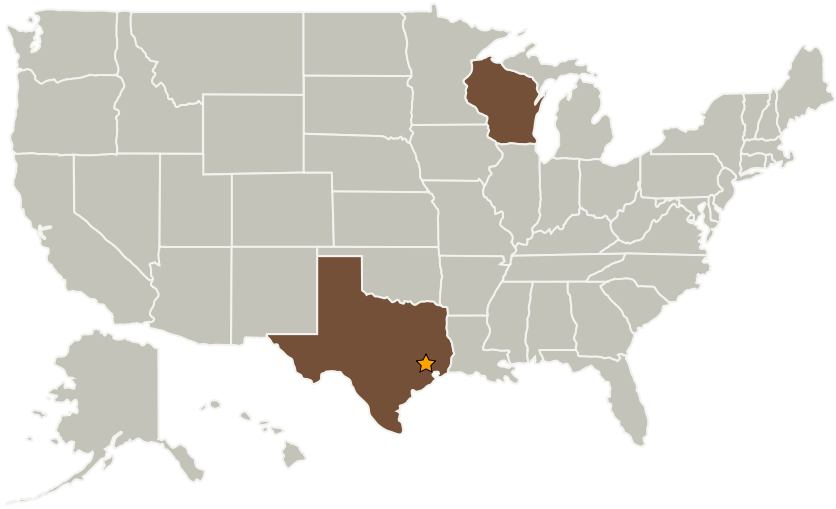

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations	
Texas	Wisconsin

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.5 Particulate Contamination Prevention and Mitigation